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U.S. Submarine Force Future Capability Vision

"Providing Undersea Superiority for Sea Power 21"

The President, Joint Chiefs of Staff, and Combatant Commanders must have persistent, clandestine, non-provocative options and, when appropriate, overt, rapid and decisive striking power to address the broad range of complex threats to the security of the United States. These capabilities are a critical component of national strategy in dealing with both state and non-state sponsored threats across the spectrum of conflict. Nuclear-powered submarines, as an element of Sea Power 21, provide these capabilities through their unique combination of stealth, endurance, agility, and firepower made possible by operating undersea either independently or as part of an interoperable Joint Force. They can provide these capabilities from the deep ocean or the challenging littorals. Their closed environment, ability to operate in close proximity to adversaries without provocation or detection, and inherent defense against anti-access threats allow them to apply their persistent multi-mission capabilities from areas that can be beyond the reach of other Joint Forces.

As the U.S. Joint Force transforms to meet new challenges in an uncertain world, four *Strategic Concepts* guide the role of our submarines in Sea Power 21 and the enhancement of their capabilities:

- *Assure Access:* Our submarines must maintain the ability to penetrate and operate in hazardous littoral areas where others cannot in order to hold anti-access threats at risk and deny sanctuary to adversaries.

- *Develop and Share Knowledge:* Our submarines must maintain the ability to clandestinely observe the undersea, surface, air and land environments. They must communicate the information gathered to the Joint Force Commander with the responsiveness necessary to rapidly defeat threats to our national security. The persistency of the information gathered counters deception and denial attempts. This provides national and military leaders with critical insights into an adversary's capabilities, tactics and operating patterns.

- *Strike Rapidly, with Surprise:* Our submarines must maintain the ability to rapidly provide offensive attack options ranging from strike warfare and special operations forces, to information operations. These attacks, emanating from apparently empty oceans and littorals, create uncertainty in a potential adversary, disrupt and complicate his planning, and cause him to devote assets to defense.

- *Dissuade and Deter:* Some states are deterred from using their naval forces to coerce neighbors or disrupt commerce because submarines can hold them at risk. Moreover, survivable nuclear-powered submarines equipped with conventional and nuclear weapons serve as a deterrent to an adversary's use of WMD against the United States or our allies. The submarine's ability to gain access under all circumstances, obtain persistent and penetrating ground truth knowledge, and to strike with force and swiftness serve to counter WMD when deterrence fails or is not effective, as may be the case with non-state sponsored threats.

In consonance with the *Strategic Concepts,* five *Technology Vectors* guide the efforts needed to deliver improved capabilities:

- *Payload:* Increased submarine payload volume to accommodate a wide and varied range of off-board vehicles, sensors, and weapons is key to expanding the submarine's sphere of influence and offensive power.

- *Modularity:* New weapons and sensors for submarines must be quickly and affordably adapted using a modular payload approach and with a flexible ocean interface.

- *Connectivity:* Improved connectivity between submerged submarines and other platforms, off-board vehicles and emerging shore and sea-based networks is critical to ensuring integration of undersea warfighting capabilities with the Joint Force. Improved connectivity includes reduction in time latency, increased throughput, and communication capability from below periscope depth at tactically useful speeds.

- *Computing and Automation:* Submarine tactical displays and decision support systems must be more intuitive and less dependent on experience for data interpretation. Automation in other areas will reduce crew size and ship cost, allowing more of the submarine's volume to be dedicated to payload. Open architectures will be incorporated into combat and information systems leveraging the rapid and affordable capability upgrades enabled by computing hardware, middleware and software changes. These architectures will serve as the information backbone for interoperability with other platforms and systems.

- *Integrated Electrical Systems:* Submarines need simplified and integrated power and propulsion systems to improve stealth, modularity and flexibility, support future payloads, and enhance affordability.

These strategic concepts and technology vectors will guide transition to a much more capable and integrated Submarine Force and will continue to encourage development of new operating concepts providing direct and relevant contributions to Sea Power 21. Within that context, several capabilities require priority development:

Sea Shield: Clandestine ASW, SUW, and MIW enabled by submarine stealth and access are vital to Joint battle space preparation and combat success against an ever-improving adversary. They allow a Joint Force commander to address the difficult cue-to-track activities ahead of a conflict, hold more of an adversary's capability at risk when the conflict starts, and shorten the timeline for Joint Force access. Specific development goals include:

- Advanced acoustic hull arrays to simplify and shorten the localization-to-kill chain for quiet diesel submarines.
- Submarine-deployable cueing sensor systems for contested littorals, expanding the area a single submarine can monitor and the number of targets it can hold at risk.
- Revolutionary methods to localize and neutralize mines, enabling safe passage of a submarine through an enemy minefield within a period of a few days. This capability will require novel sensors and operating concepts, and should leverage unmanned vehicles to increase platform-to-mine standoff range.

- Integrating an airborne anti-surface weapon into the submarine payload, enabling high volume offensive firepower from stand off ranges for attack against shallow draft surface vessels operating in the littorals.

Sea Strike: Undersea-delivered tactical strike, strategic deterrence, special forces, and information operations capabilities in place prior to the start of a conflict provide a Joint Force commander a broad range of options for rapid tasking against an adversary's defensive systems and offensive maneuvers. These same capabilities are available to global or regional commanders to be employed against non-state sponsored threats and other fleeting targets of opportunity. Specific development goals include:

- Persistent and clandestine surveillance, shaping, and targeting methods to expand the area a single submarine can monitor and hold at risk, including extended reach over land. This capability should use a network of SOF personnel, off-board vehicles, and intrusive sensors delivered and coordinated from the submarine.
- Transformation of strategic deterrent technologies, expertise, and capabilities, expanding their availability for conventional use.
- Integrating an anti-air weapon into the submarine payload, enabling the continued application of submarine offensive power when contested in the littorals.
- Integrating an unmanned aerial vehicle into the submarine payload to provide expanded sensor delivery and over the horizon surveillance and targeting.

Sea Basing: Positioning offensive and defensive capability undersea in the littorals serves as the leading edge of the Joint Sea Base and leverages our asymmetric advantage to learn about, defend against, and strike at an adversary from inside his ring of comfort and ahead of a conflict if required. That same capability is rapidly available to strike at non-state threats that are fleeting or require a clandestine approach. Specific development goals include:

- Sensors and processors to improve submarine tactical control in the shallow congested littorals providing a 360-degree sphere of 24 hour, all weather contact detect and track, while operating deep, in transition, and at periscope depth.
- Affordable payload capsules to enable the practical integration of a wide variety of weapons and vehicles not specifically or originally designed for submarine employment.
- Submarine payload capacity, with flexible ocean interfaces, to increase the extent of the capability we can base undersea. The goal is to affordably increase the payload capacity to enable the capability to deliver the off-board vehicles and additional payloads that improve Joint Force warfighting performance'. Fundamental changes in construction methods and designs that improve platform affordability are needed.
- Platform and payload strategies to achieve the capabilities outlined in this vision.

FORCEnet: Submarines must be a part of Joint and Service information networks, to include sensors and networks deployed from the submarine and off-board vehicles. Effective integration into these networks allows the submarine to share situational awareness, plan collaboratively and fight synergistically with other Joint Forces. Specific development goals include:

- Connectivity from below periscope depth at tactically useful speeds to reduce time latency in the exchange of information for situational awareness, blue force tracking, and target engagement. First priority will be placed on improving this capability for ASW.

Sea Warrior: The technical skill, leadership, innovative spirit, and warfare professionalism of our people are key to our future and remain a central focus. To continue to attract talented people and have them prevail in combat, we must focus on developing Joint warfighters for the future. Specific development goals include:

- Ships, systems, and policies designed around a warrior mentality to reduce the time required for non-warfighting functions and increase the time spent honing warfare skills, especially as a team.
- An institutional system to better identify, use, and reward fleet innovation.
- Accession, promotion, and selection policies that reward characteristics and skills needed to develop and employ the capabilities identified in this vision.

Sea Enterprise: The Submarine Force will accomplish its mission with improved productivity. The following objectives will be foremost in the design and implementation of future capability:

- Reduced platform manning.
- Sustained readiness at lower support cost.
- Reduced platform acquisition costs.
- Efficient platform utilization and employment approaches to maximize purposefully deployed, surge-capable undersea combat capability.

Sea Trial: The Submarine Force is an integral part of the Navy's Sea Trial process and values the role this process plays in evolving operating concepts into new operational capability for the force. Invoking a focused and disciplined approach to this process will expedite promising technologies and concepts to the Fleet. To support this, the Undersea Experimentation Working Group (UEWG) and SUBTECH will coordinate to:

- Operate a process that develops, reviews, and injects innovative concepts and technologies in support of the capabilities in this vision. The process will provide purposeful data collection and analysis of field experiments, focused to support decision-making on which should transition to operational capability.
- Remain amenable to explore capabilities not necessarily articulated in this vision if Service and/or Joint gaps and seams identify unique or overwhelming value when the capability is delivered from a submarine.

In following this vision, we exploit the asymmetric advantages of the undersea environment to provide capabilities in support of Joint warfighting as it transforms to meet uncertain threats. Our undersea forces will have a greater sphere of influence, will carry more payload, will be increasingly unmanned and automated, will be networked with distributed sensors, and will be fully integrated with other forces and systems. They will reach farther into enemy areas with greater pervasiveness, respond faster with greater lethality, and be capable of evolving to address new threats in less time and with less expense.